

# HYD Team - Programming Project

## Project 9: Hospital Management System with Patient Care

### Description

Develop a comprehensive hospital management system that handles patient records, appointment scheduling, medical staff management, billing, and includes basic medical analytics and reporting.

### Core Requirements

- Patient registration and medical history management
- Doctor and staff scheduling system
- Appointment booking with conflict resolution
- Medical billing and insurance processing
- Prescription and medication tracking
- Emergency department workflow
- Medical equipment inventory management

### Technical Specifications

```
# Expected functions (minimum):
def register_patient(patient_id, personal_info, medical_history, insurance_info)
def add_medical_staff(staff_id, name, specialization, shift_schedule, contact_info)
def schedule_appointment(patient_id, doctor_id, appointment_date, appointment_type)
def create_medical_record(patient_id, doctor_id, diagnosis, treatment, prescription)
def process_billing(patient_id, services_list, insurance_coverage)
def manage_emergency_admission(patient_id, emergency_type, severity_level)
def track_medication_inventory(medication_id, quantity, expiry_date, supplier)
def assign_room(patient_id, room_type, admission_date, expected_duration)
def calculate_treatment_cost(patient_id, treatment_plan, insurance_details)
def generate_patient_report(patient_id, report_type)
def analyze_hospital_efficiency(metrics_type, time_period)
def manage_discharge_process(patient_id, discharge_date, follow_up_instructions)
```

### Edge Cases to Handle

- Emergency admissions without prior registration
- Doctor unavailability and last-minute replacements
- Insurance claim rejections and alternative payment methods
- Medication allergies and contraindication warnings
- Room occupancy conflicts during peak periods
- Medical equipment maintenance schedules
- Patient privacy and data security compliance

### Expected Output Examples

```
=== PATIENT DASHBOARD ===
Patient: Rajesh Kumar (ID: P12345)
Age: 45 | Gender: Male | Blood Type: B+
Insurance: Star Health (Policy: SH789456)
```

Current Status: Inpatient  
Room: 204-A (General Ward)  
Admitted: March 15, 2025  
Attending Doctor: Dr. Priya Mehta (Cardiology)

Recent Vitals (March 17, 2025 - 8:00 AM):  
Blood Pressure: 130/85 mmHg  
Heart Rate: 78 BPM  
Temperature: 98.6°F  
Oxygen Saturation: 97%

Active Medications:  
- Metoprolol 50mg - Twice daily  
- Aspirin 75mg - Once daily  
- Atorvastatin 20mg - Bedtime

=== APPOINTMENT SCHEDULE ===  
Dr. Sarah Johnson - Cardiology  
March 18, 2025

09:00 - Consultation - Amit Patel (Follow-up)  
09:30 - Consultation - Sunita Devi (New patient)  
10:00 - ECG Review - Rajesh Kumar  
10:30 - Surgery Preparation - Vikram Singh  
11:00 - BREAK  
11:30 - Emergency Consultation - AVAILABLE  
12:00 - Consultation - Meera Sharma (Routine checkup)

Upcoming Surgeries:  
March 19: Angioplasty - Vikram Singh (OR-2, 10:00 AM)  
March 20: Pacemaker - Mrs. Gupta (OR-1, 2:00 PM)

=== BILLING SUMMARY ===  
Patient: Rajesh Kumar  
Admission Date: March 15, 2025  
Discharge Date: March 18, 2025

Service Charges:  
Room Charges (3 days): ₹4,500  
Doctor Consultation: ₹2,000  
ECG Test: ₹800  
Blood Tests: ₹1,200  
Medications: ₹1,800  
Nursing Care: ₹2,400

Total Bill: ₹12,700  
Insurance Coverage (80%): ₹10,160  
Patient Responsibility: ₹2,540

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